

Specification

The disclosure is objected to for informalities. It is alleged that there is no brief description of Figure 5(D) on page 37. Applicants respectfully note that the objection is moot in view of the specification amendments indicated herein.

It is further alleged that on page 38, the reference to Figure 11 should instead be to Figures 11(A) and 11(B). Applicants respectfully point out that this objection is also moot in view of the specification amendments indicated herein. Applicants urge withdrawal of the objections.

Oath/Declaration

The oath/declaration is objected to for being defective for not identifying the citizenship of each inventor. Applicants respectfully urge that the objection is moot in view of the attached substitute oath/declaration, identifying the country of citizenship for each inventor, submitted herewith. Applicants urge withdrawal of the objection.

Claim Objections

Claim 20 is objected to for not ending with a period. This objection is also moot in view of the claim amendment indicated herein. Applicants therefore urge withdrawal of all objections.

Claim Rejections - 35 U.S.C. 102

Claims 1, 7, 8, 9, 13 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Ueda (U.S. Patent No. 5,790,732).

Applicants respectfully disagree. The present invention in a preferred embodiment is concerned with a preliminary member of an optical device component with optical fiber comprising a long capillary tube made of glass or crystallized glass and an optical fiber inserted and fixed in an inner hole of the long capillary tube. The preliminary member will produce, by cutting, a plurality of short capillary tubes with optical fibers each of which composes an optical device component to be connected to an optical connector. (See claim 1).

In another preferred embodiment, the present invention is concerned with a method for manufacturing a preliminary member of an optical device component with optical fiber, the preliminary member will produce, by cutting, a plurality of short capillary tubes with optical fibers each of which composes an optical device component to be connected to an optical connector, comprising the steps of manufacturing a long capillary tube by forming softened glass or crystallized glass; providing a substantially conical flare portion at an end portion of the long capillary tube for guiding the optical fiber to an inner hole of the long capillary tube; filling an adhesive into the inner hole of the long capillary tube; inserting a long optical fiber whose covering has been removed into the inner hole through the flare portion; and curing the adhesive to fix the optical fiber in the long capillary tube. (See claim 13).

In contrast, Ueda is directed to optical connectors for detachably connecting optical fibers with each other. Ueda discloses an optical connector comprising a ferrule for accommodating an optical fiber, the ferrule comprising a glass cylinder, the glass cylinder having a small-diameter first through hole at a central axis portion thereof to accommodate a bare optical fiber, and a protection thin layer coating (col. 2, lines 24-31). It appears the glass cylinder may have a flared portion (See part 5 in Figures 1-3).

In addition, Ueda discloses melting and drawing a glass preform to form a ferrule shape (See claim 6). Ueda discloses cutting a glass preform after coating to have a predetermined length, thereby forming the ferrule (See claim 6). Ueda discloses the protection thin layer as increasing the strength of the ferrule (See claim 3). Ueda also discloses the glass ferrule inserted in a terminal component 7 and fixed by adhesion, and the optical fiber fixed to this assembly by adhesion (Figure 3; col. 3, lines 34-39). Finally, Ueda discloses the performance of ion exchange to increase the strength of a glass ferrule (col. 1, line 65 to col. 2, line 1).

However, Applicants respectfully urge that Ueda is unable to teach or suggest any invention as claimed. Applicants urge in particular that Ueda does not disclose or suggest a preliminary member with an optical fiber inserted and fixed in an inner hole of a long capillary tube, as claimed, but instead discloses simply a method for producing a glass ferrule itself. With reference to Figure 5, it can be seen that in Ueda a glass preform 25 is subjected to centering so that the ratio of the inner diameter to the outer diameter of an inner diameter 14 is equal to that of a final ferrule, and subsequently the

glass preform is subjected to drawing (col. 3, line 60 to col. 4, line 14). The resulting glass preform 15 is sequentially cut into pieces to obtain a starting tube 20 of the ferrule. Thereafter, the taper portion 5 to help insert the optical fiber and the chambered portion 6 are formed to the starting tube 20, thus obtaining the final shape of the glass ferrule 1 (See Figure 2). Also important to note, after assembling the glass ferrule 1 and the terminal component 7, the optical fiber 11 is inserted in the through hole 9 of the terminal component 7 (col. 3, lines 34-43).

Applicants respectfully submit that from such disclosures of Ueda, it is quite apparent that the glass ferrule 1 is given a final shape prior to the insertion of any optical fiber. Accordingly, any resulting glass preform that is cut into pieces includes no optical fiber, in contrast to the claimed invention. Applicants note that a similar problem arises with the Severijns reference, as discussed below. Moreover, with respect to claim 13, it is noted that in Ueda an adhesive is filled into the through hole 4 of the glass capillary 2. However, the adhesive is not filled into the long capillary tube that makes up the preliminary member with the optical fiber, as is required in claim 13. Therefore, in that the cited reference is unable to teach or suggest each and every element of the claimed invention, Applicants urge withdrawal of the rejection.

Claim 25 is rejected under 35 U.S.C. 102(b) as being anticipated by Severijns (U.S. Patent No. 4,698,084).

Applicants respectfully disagree. The present invention in a preferred embodiment is concerned with an optical fiber stub manufactured by a manufacturing

method, the optical fiber stub connected to an optical connector, the method comprising the steps of forming softened glass or crystallized glass into a long capillary tube; inserting and fixing a long optical fiber into an inner hole of the long capillary tube along almost the entire length of the inner hole to manufacture a long capillary tube with optical fiber; cutting the long capillary tube with optical fiber into a plurality of first capillary tubes with optical fibers each of which has a predetermined length; and polishing end faces of the first capillary tube with optical fiber. (See claim 25).

In contrast, Severijns is directed to the manufacture of passive fiber optical components. In manufacturing the optical component, Severijns discloses a capillary tube obtained by drawing a long tube from a preform of quartz glass, then subdividing this tube into capillary tubes (col. 6, lines 7-13). Severijns also discloses heating a capillary tube, and inserting and fixing the free end of a single fiber in the capillary tube so as to fuse with the end portions of fibers to form a solid rod (col. 7, lines 5-17 and 32-34). Severijns further discloses that the resulting fiber head is finished by grinding and polishing to form an end face (col. 7, lines 21-23).

Applicants therefore respectfully submit that Severijns is also unable to teach or suggest any invention as claimed. Like Ueda, the Severijns reference also fails to teach or suggest cutting any long capillary tube with optical fiber into a plurality of short capillary tubes with optical fibers, as claimed, each of which may have a predetermined length. That is, while Severijns may disclose subdividing a capillary tube (without optical fibers) into a plurality of tubes (col. 6, lines 7-13), the reference clearly does not

teach or suggest cutting any capillary tube with optical fiber into a plurality of short capillary tubes with optical fibers, as claimed. In other words, as noted above, any resulting tube of Severijns has no optical fiber, in clear contrast to the claimed invention. Thus, the cited reference fails to teach or suggest each and every element of the claimed invention, and the rejection should be withdrawn.

Claim Rejections - 35 U.S.C. 103

Claims 2-4, 6, 14 and 22 are rejected under 35 U.S.C. 103(a) as being obvious over Ueda (U.S. Patent No. 5,790,732).

Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being obvious over Ueda (U.S. Patent No. 5,790,732) in view of Sherrer (U.S. Patent Application No. 2001/0055449 A1).

Claim 12 is rejected under 35 U.S.C. 103(a) as being obvious over Ueda (U.S. Patent No. 5,790,732) in view of Andersen (U.S. Patent No. 6,190,055).

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being obvious over Ueda (U.S. Patent No. 5,790,732) in view of Fukijawa (U.S. Patent No. 4,988,161).

Claim 18 is rejected under 35 U.S.C. 103(a) as being obvious over Ueda (U.S. Patent No. 5,790,732) in view of Omiya (U.S. Patent No. 6,450,696).

Claims 19-21 and 23 are also rejected under 35 U.S.C. 103(a) as being obvious over Ueda (U.S. Patent No. 5,790,732) in view of Matsuura (U.S. Patent No. 5,187,762).

Applicant respectfully disagree. The present invention in preferred embodiments has been discussed above.

Ueda has also been discussed above.

Sherrer is cited for the disclosure that the capillary tube can take a polygonal shape, and that it would be advantageous to use polygonal shapes to facilitate fabrication (See Figure 2; para. 27).

Andersen is cited for disclosing an optical device component as component for an optical fixed attenuator (col. 1, lines 5-15). It is alleged that is well known in the art that optical fibers have a constant attenuation factor (See page 8 of the Office Action).

Fukijawa is cited for the disclosure that a conical flare portion of a glass capillary tube is formed by corrosive solution (col. 1, lines 45-55).

Omiya is cited as disclosing the configuration described in claim 18 and that such a configuration is advantageous (Figure 3; col. 10, lines 5-15).

Matsuura is cited for disclosing heat curing (col. 2, lines 60 to col. 3, lines 2-25) of adhesive.

However, as discussed above, the primary reference of each of these rejections, Ueda, fails to teach or suggest that a preliminary member comprising a capillary tube and optical fiber inserted and fixed therein, will produce, by cutting, a plurality of short capillary tubes with optical fibers, as claimed. That is, in Ueda, any resulting glass preform that is cut into pieces includes no optical fiber, in contrast to the claimed invention. Applicants urge that no combination of the cited secondary references is able

to cure this deficiency of Ueda, by teaching or suggesting such an element as claimed. Thus, no combination of the cited references is able to teach or suggest each and every element of the claimed invention.

Claims 26-29 and 31 are also rejected under 35 U.S.C. 103(a) as being obvious over Severijns (U.S. Patent No. 4,698,084).

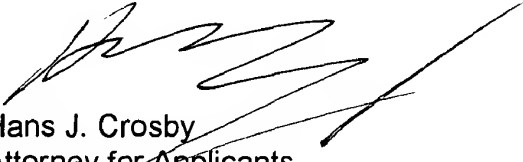
Claim 30 is rejected under 35 U.S.C. 103(a) as being obvious over Severijns (U.S. Patent No. 4,698,084) in view of Ueda (U.S. Patent No. 5,790,732).

Applicants again respectfully disagree. Both Severijns and Ueda are discussed above. As previously noted, neither of these references teach or suggest cutting a long capillary tube with optical fiber into a plurality of short capillary tubes with optical fibers, as claimed, each of which may have a predetermined length. In other words, neither of the references teach or suggest any resulting tube with optical fiber, as required by the claimed invention. Applicants urge that no combination of the cited references is able to cure this deficiency. Accordingly, the cited references, alone or in combination, fail to teach or suggest each and every element of the claimed invention, and all rejections should be withdrawn.

In view of the amendments and remarks above, Applicants submit that this application is in condition for allowance and request favorable action thereon.

In the event this paper is not timely filed, applicants hereby petition for an appropriate extension of time. The fee for this extension may be charged to our Deposit Account No. 01-2300, along with any other additional fees which may be required with respect to this paper referencing Attorney Docket No. 100725-00046.

Respectfully submitted,
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Enclosure: Marked-Up Copy of the Specification
Marked-Up Copy of the Claims
Substitute Declaration

HJC/ccd

MARKED-UP COPY OF THE SPECIFICATION

Please amend page 37 (second full paragraph) as follows:

Fig. 5(A) is an explanatory view for filling adhesive in a long capillary tube, Fig. 5(B) is an explanatory view for inserting an optical fiber into the long capillary tube of Fig. 5(A), [and] Fig. 5(C) is an explanatory view for curing adhesive, and Fig. 5(D) is an explanatory view for adhering an optical fiber.

Please amend the paragraph bridging pages 38 and 39 of the specification as follows:

Fig. 11(A) is an [Figs. 11 are] explanatory view [views] of a manufacturing method of the prior-art optical fiber stub. Fig. 11(B) is another explanatory view of a manufacturing method of the prior-art optical fiber stub.

MARKED-UP COPY OF THE CLAIMS

20. (Amended) A method for manufacturing a preliminary member of an optical device component with optical fiber as set forth in Claim 19, where the adhesive heap is supported by a transparent member, and wherein the optical fiber is inserted into the inner hole of the long capillary tube while observing the optical fiber.